

REMARKS

This filing is in response to the Office Action, dated December 19, 2002, where the Examiner has rejected claims 1-23 pending in the present application. Reconsideration and allowance of pending claims 1-23 in view of the following remarks are respectfully requested.

A. Rejection of Claims 1-2 and 6 Under 35 USC §103(a)

The Examiner has rejected claims 1-2 and 6 under 35 USC §103(a) as being unpatentable over Koo, et al. (USPN 5,677,234) ("Koo '234") in view of Chang, et al. (USPN 5,834,351) ("Chang '351"). For the reasons that follow, applicant respectfully disagrees, and submits that claims 1-2 and 6 are patentably distinguishable over the cited references.

Independent claim 1 specifies a method including the steps of covering a first area in a dielectric, wherein the dielectric has a first dielectric constant. Independent claim 1 further specifies the steps of exposing a second area in the dielectric to a dielectric conversion source so as to increase the first dielectric constant of said dielectric in the second area to a second dielectric constant. As a result, the first area of the dielectric will have a first dielectric constant, and the second area of the dielectric will have a second dielectric constant greater than the first dielectric constant.

In rejecting claim 1, the Examiner has cited Koo '234 and Chang '351. However, as discussed below, neither Koo '234 nor Chang '351, taken either singly or combination, discloses, teaches or suggests the method specified by claim 1. Referring first to the Koo '234 reference, Koo '234 discloses a method for forming isolated semiconductor device active regions. With specific reference to Column 3, lines 12-35, cited by the Examiner, Figures 2B-2C of Koo '234 discloses a particular process of nitrating a surface of buffer layer 14. According to Koo '234,

this nitrating step is performed to form a layer of silicon oxynitride (SiON) over buffer layer 14 (col. 3, Ins. 22-27) so that the “masking properties of the top oxidation resistant layer can be enhanced” (col. 3, Ins. 32-35). Thus, Koo ‘234 is essentially directed to a process for nitrating buffer layer 14 to form a SiON layer on the top surface of buffer layer 14. Koo ‘234 does not disclose nor remotely suggest exposing a second area in a dielectric to a dielectric conversion source so as to increase the first dielectric constant of the dielectric in the second area to a second dielectric constant, as specified by independent claim 1. In sum, Koo ‘234 is not directed to the controlled increase of the dielectric constant in a designated area, e.g., “the second area”, of a dielectric, but is instead directed to the formation of a SiON layer over the top surface of buffer layer 14. For these reasons, Koo ‘234 is a significant departure from the method specified by claim 1, and therefore neither discloses nor suggests the method of claim 1.

Referring to the secondary reference, Chang ‘351, the basic deficiencies of Koo ‘234 are not overcome by the disclosure of Chang ‘351. The Examiner cites Figure 1D of Chang ‘351, which illustrates a step of masking the memory array to form memory cell 16 (col. 4, Ins. 57-58). However, Chang ‘351 neither discloses nor suggests exposing a second area in a dielectric to a dielectric conversion source so as to increase the first dielectric constant of the dielectric in the second area to a second dielectric constant, as specified by independent claim 1. In contrast, Chang ‘351 merely relates to nitridation, i.e., for forming an oxynitride layer, (col. 4, Ins. 50-56 and Figure 1C), and does not disclose a process for the controlled increase of the dielectric constant in a designated area, e.g., “the second area”, of a dielectric. For all the above reasons, the combined references of Koo ‘234 and Chang ‘351 fail to disclose or suggest the method defined by claim 1. Accordingly, it is respectfully submitted that independent claim 1 and its corresponding dependent claims 2-10 should be allowed.

B. Rejection of Dependent Claims 3-5 and 7-10 Under 35 USC §103(a)

The Examiner has further rejected dependent claims 3-5 under 35 USC §103(a) as being unpatentable over Koo '234 in view of Chang '351, and further in view of Hakey (6,313,492) ("Hakey '492"). The Examiner has also rejected dependent claim 7 under 35 USC §103(a) as being unpatentable over Koo '234 in view of Chang '351, and further in view of Hintermaier, et al. (USPN 6,303,391) ("Hintermaier '391"). The Examiner has also rejected dependent claim 8-10 under 35 USC §103(a) as being unpatentable over Koo '234 in view of Chang '351, and further in view of Greco (USPN 5,925,960) ("Greco '960").

As discussed above, independent claim 1 is patentably distinguishable over Koo '234 and Chang '351, and, as such, claims 3-5 and 7-10 depending from independent claim 1 are, *a fortiori*, also patentably distinguishable over Koo '234 and Chang '351.

C. Rejection of Claims 11-17 and 23 Under 35 USC §103(a)

The Examiner has rejected claims 11-17 and 23 under 35 USC §103(a) as being unpatentable over Koo '234 in view of Chang '351, and further in view of Greco '960.

Applicant respectfully disagrees. Each of independent claims 11, 14, and 16 specifies limitations analogous to those specified in claim 1. In substance, independent claims 11, 14 and 16 specify exposing a second area in a dielectric to a dielectric conversion source so as to increase the first dielectric constant of the dielectric in the second area to a second dielectric constant. In claim 16, the dielectric is a "gap fill dielectric."

As discussed above, the combined references of Koo '234 and Chang '351 fail to disclose or suggest the above-specified method, and, as such, independent claims 11, 14 and 16 are patentably distinguishable over Koo '234 and Change '351 and should be allowed. For at least the same reasons claims as set forth above, claims 12-13, depending from independent claim 11,

claim 15, depending from independent claim 14, and claims 17-23, depending from independent claim 16, should also be allowed.

D. Rejection of Dependent Claims 18-20 and 21-22 Under 35 USC §103(a)

The Examiner has further rejected dependent claims 18-20 under 35 USC §103(a) as being unpatentable over Koo '234 in view of Chang '351, further in view of Greco '960, and further in view of Hakey '492. The Examiner has also rejected dependent claim 21-22 under 35 USC §103(a) as being unpatentable over Koo '234 in view of Chang '351, further in view of Greco '960, and further in view of Hintermaier '391.

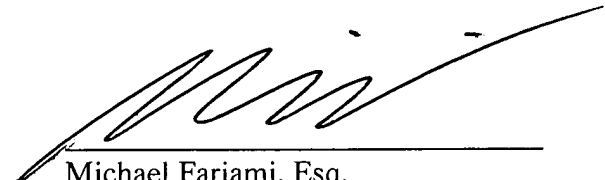
As discussed above, independent claim 16 is patentably distinguishable over Koo '234 and Chang '351, and, as such, claims 18-20 and 21-22 depending from independent claim 16 are, *a fortiori*, also patentably distinguishable over Koo '234 and Chang '351.

E. Conclusion

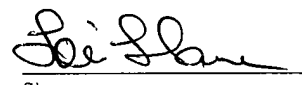
For all the foregoing reasons, an early allowance of claims 1-23 pending in the present application is respectfully requested.

Respectfully Submitted;
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